

## **Abstract**

There are very diverse types of fruits. Therefore, the high data variance of fruit images requires the right features to be recognized. Because the use of a single feature is not effective for such a high data variance, a hybrid approach is needed. Since some studies have stated that the hybrid of several features in the case of the fruit recognition system has been proven to improve accuracy, we have attempted to propose a fruit recognition system using our proposed method. The data used in this study are gathered from the research dataset conducted by previous research using the Convolutional Neural Network method. The dataset has 82213 images with 120 classes. With high variance data, their system obtained high accuracy, but unfortunately, it takes high computation time. With the same dataset, we tried to recognize fruits by combining 3 (three) feature extraction methods, namely Local Binary Pattern as texture features, Moment Invariants (Hu moments) as shape features and HSV color spaces as color features. This system uses the Random Forest Algorithm for the classifier. With the proposed method, the system performed with an accuracy of 94,83% with an overall running time of about 17 minutes 1 second (15 minutes 22 seconds for the training scheme, 1 minute 39 seconds for the test scheme), which is almost 10 times faster than previous research.

**Keywords :** Fruit Recognition, Local Binary Pattern, Moment Invariants. HSV Color Space, Random Forest Algorithm